

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) An electronic driving device (20) for turning on and off a synchronous pump comprising a synchronous electric motor (1) with a permanent-magnet rotor (8), comprising:

- at least a static power switch (17) inserted in series between the motor (1) and an AC electric power supply source (V_p); and
- a processing unit (16) having at least an input receiving a synchronism signal (V) and a control output connected to said switch (17);
- ~~characterised in that~~ wherein [[it]] the electronic driving device is enabled by a signal emitted by a float level sensor (40) and includes an input receiving a signal (α) by a position sensor (21) detecting the rotor (8) polarity and position;
- wherein the pump turn-on and off ~~being~~ is regulated according to the signal emitted by said level sensor (40) and to a measured difference between a critical load angle (δ) and a current load angle computed during different working conditions of the pump.

2. (Currently amended) [[A]] The device according to claim 1, ~~characterised in that~~ wherein said position sensor (21) is a Hall-effect sensor.

3. (Currently amended) [[A]] The device according to claim 1, ~~characterised in that~~ wherein the motor comprises rotor poles (N, S) divided by an ideal plane (9) whose rest position is orthogonal to the position of said position sensor (21).

4. (Currently amended) [[A]] The device according to claim 1, ~~characterised in that~~ wherein said float level sensor (40) comprises a Hall probe (37).

5. (Currently amended) ~~[[A]]~~ The device according to claim 1, ~~characterised in that wherein~~ the float (36) of said level sensor (40) is incorporated in an envelope (34), externally associated with the body (25) of the pump (15) and the sensor element (37) of said level sensor (40) is housed in the pump body (25) in correspondence with said float (36).

6. (Currently amended) ~~[[A]]~~ The device according to claim 5, ~~characterised in that wherein~~ said float (36) is equipped in its lower part with a permanent magnet (29).

7. (Currently amended) ~~[[A]]~~ The device according to claim 1, ~~characterised in that wherein~~ said pump (15) is an immersion pump.

8. (Currently amended) ~~[[A]]~~ The device according to claim 1, ~~characterised in that wherein~~ said electronic device (20) is housed on an electronic board (38) positioned inside the pump body (25) in a position just underlying the float level sensor (40).

9. (Currently amended) ~~[[A]]~~ The device according to claim 1, ~~characterised in that wherein~~ said phase displacement is indirectly measured in said unit (16) by detecting the rotor inductance, by means of said sensor (21), being complementary to the back electromotive force.

10. (Currently amended) ~~[[A]]~~ The device according to claim 1, wherein the pump is immediately turned off if the value of a counter (T2) is greater than ~~[[e]]~~ a predetermined time limit (Te) defined for an emergency stop.

11. (Currently amended) ~~[[A]]~~ The device according to claim 1, wherein said critical load angle (δ) is a mean value among N sampled values.

12. (Currently amended) ~~[[A]]~~ The device according to claim 1, ~~characterized by further comprising~~ a first time counter (T1) that is incremented every time instant[[s]] wherein

the float level sensor is low and the pump is off to check the inactivity time period of the pump and turn it on for a predetermined short time period.